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13152

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Packet Radio Temporary Note #1

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Packet Radio Meeting of December 12-13, 1972

A meeting was held at Stanford Research Institute on 12-13 December to discuss the subject of packet radio communication and its application to local distribution of data in urban and rural environments, offices, etc. Representatives from ARPA, NAC, SRI, UCLA, Collins Radio, Xerox PARC, and University of Hawaii were in attendance. A variety of subjects were discussed and numerous questions were raised concerning the following:

- Properties of frequency bands - noise/LOS/power
- Capture phenomena
- Spread-spectrum techniques
- Power sources
- Slot synchronization
- Repeaters
- Hand-off techniques — passing data technique
- Reservations
- Modulation schemes
- Multistation interference
- Technical and cost comparisons
- Debugging and maintenance considerations
- Personal terminals (handheld)

The following notational conventions were initially adopted. A terminal is to be identified as a packet radio terminal or PRT. PRT's are in communication with one or more Packet Radio Stations (PRS for short). Terminals sufficiently distant from a station may require the assistance of one or more Packet Radio Repeaters (PRR) to relay data to the PRS. The PRS in turn transmits data to the terminal directly, if possible, or via PRR's if distance warrants. The station is also able to interface directly to other networks. For simplicity in notation, each station can be denoted by an S, each repeater by an R, and each terminal by a T.

A Packet Radio (PR) Group has been established at SRI's Network Information Center. Background, tutorial, new technical work, and administrative messages should be distributed via PR notes; SRI will assign them numbers, keep records, and distribute the information as

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part of their standard NIC service. (More information will follow on this.) These PR notes are intended to be temporary working notes -- to have a short active lifetime after which they will "disappear" from the files. Important notes can be upgraded to a more permanent status or combined with other notes. We can obviously experiment with this system somewhat as time goes on.

The following areas were suggested as possible areas of specialization.

- User requirements
- Component selection
- Queuing analysis
- Functional organization
- System design
- Cost studies
- Radio-propagation characteristics
- Reliability studies
- Coordination/management

It was suggested that a characterization of user traffic would be helpful. The following "hypothetical" data was generated as an example. We will need to provide more carefully considered estimates based on equipment evaluation and many other factors.

	NUMBER OF TERMINALS	PACKETS/SEC WHEN ACTIVE IN	PACKETS/SEC WHEN ACTIVE OUT	AVERAGE PACKET SIZE E(N)	% OF TIME ACTIVE
Compressed voice	330	2.5	2.5	360	3
TTY like terminals	100	1.0	0.1	100	10
Unattended sensors	1600	0	0.01	50	100
Small computers	10	10	1	1000	5
Displays and printers	16	10	1	1000	5
Position/location	500	0	0.01	0	100

95 P/S at 1000 bits = 100 kb

120 P/S at 400 bits = 50 kb -- 100-150 kb channel

The importance of issues (guidelines) such as interfacing, privacy and security, accounting, and human factors during the design phase was duly noted. These guidelines need to be elaborated, however.